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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,452	11/16/2001	Satoshi Aoyagi	SIW-022	5172
959 7590 09/28/2007 LAHIVE & COCKFIELD, LLP ONE POST OFFICE SQUARE BOSTON, MA 02109-2127			EXAMINER WALKER, KEITH D	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 09/28/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

09/988,452

Applicant(s)

AOYAGI ET AL.

Examiner

Keith Walker

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 and 36 is/are pending in the application.
- 4a) Of the above claim(s) 1-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

Claims 1-34 & 36 are pending in the application with claims 1-34 withdrawn from consideration.

Claim 36 is pending examination and rejected for the reasons below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1. Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what "synthetic output characteristic" and "current-voltage characteristic representation" mean. These two "characteristics" are described as lines in figure 10A but no description is given as to how these lines were graphed or how one skilled in the art would reproduce these "characteristics" for a particular fuel cell. The elements, features or numbers represented by the "characteristics" is ambiguous and it is unclear how these "characteristics" would be obtained by one of ordinary skill in the art.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. As best understood, claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (5,964,309), in view of JP 08-214452 (Takeshi).

Kimura teaches a power supply system with a stack of fuel cells connected to a storage battery in parallel. The reacting gases are supplied to the fuel cell in amounts based on the estimated output of the fuel cell, the charge of the storage battery, and the amount of power required by a load. The feed amount includes the amount required for providing the required power to the load and a feed adjustment based on the charge state of the storage battery. The storage battery may be charged by the fuel cell and/or supply energy to the load in addition to that supplied by the fuel cell (Figs. 1 & 7, Abstract). The fuel cell system determines the amount of reactants needed to supply the fuel cell based on the charge-discharge state of the battery. Thus, if the battery is in short supply of power, then a larger supply of reactants to the fuel cell is needed to overcome the shortage of reserve power in the battery (2:45-3:31). Reactant gases are supplied to the fuel cell based on target values of the motors and machinery used with an electric vehicle (8:15-41).

However, Kimura fails to teach a capacitor that is directly connected to the fuel cell.

Takeshi teaches a hybrid power system in which batteries or electric double capacitors are charged by a fuel cell and provide additional power to a load ([0002-0004], [0010]). The current-voltage characteristics of the fuel cell and of the energy

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storage device (whether it be a battery or capacitor) inherently depend on their respective internal resistances (Ohm's Law:  $V=IR$ ). The system evaluates the internal resistance of the capacitor and increases the reactants of the fuel cell to overcome the resistance of the capacitor ([0018-0019]). The capacitor is used to supply a temporary supplemental amount of power to the load due to an increase in the power requirements (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to would have recognized the ability of an electric double capacitor in the hybrid system as taught by Takeshi to perform the same function as the storage battery in the fuel cell power supply system as taught by Kimura because batteries and capacitors are equivalent means to provide additional power to a load and to be charged by fuel cells.

### ***Response to Arguments***

Applicant's arguments filed 7/2/07 have been fully considered but they are not persuasive. Applicant argues Kimura's system prevents a gas shortage state during charging after the variation in the load. The applicant's prevention of the gas shortage, as claimed, is also after the variation in the load. Claim 36 states, "determining a voltage of the fuel cell after a variation of electrical load" (emphasis added). Kimura's system also teaches a supplying the reacting gas in an amount that is the sum of the excess supply amount and the equilibrium supply amount before the variation of the electrical load. It is this excess supply amount above the equilibrium state that allows

the fuel cell to produce enough power to supply both the battery and load with the correct amount of power.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Walker

**MARK RUTHKOSKY**  
**PRIMARY EXAMINER**

*Mark Ruthkosky* 9/24/07